

5.2) 1-43 odd HW

Exponential Functions

Your rich uncle is going to give you an allowance. You have a choice.

Either \$1,000,000 a day
OR

every month { 1 penny on the first day, 2 pennies on the second day,
4 pennies on the 3rd day, 8 pennies on the fourth day,
and so on
Which do you choose?

Day	Uncle	total
01	.01	$2^1 - 1 \cdot 01 = 2 - 1$
02	.02	$2^2 - 1 \cdot 03 = 4 - 1$
03	.04	$2^3 - 1 \cdot 07 = 8 - 1$
4	.08	\vdots \vdots 15 = 16 - 1
\vdots	\vdots	\vdots

$$2^0 + 2^1 + 2^2 + 2^3 + \dots + 2^n = 2^{(n+1)} - 1$$



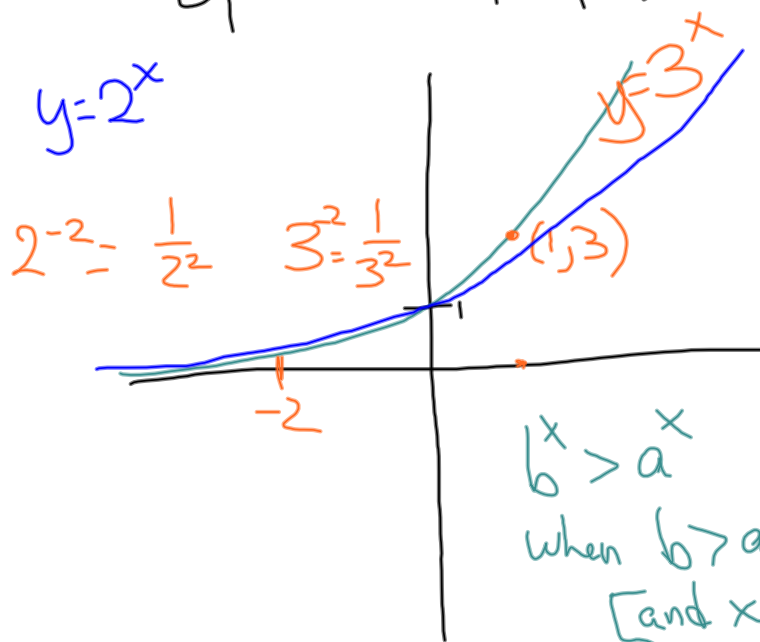
29	$2^{29} - 1$	536,870,911
30		1,073,741,823
31		2,147,483,647
32		4,294,967,295

A certain bacteria doubles
every hour.

After 10 hours, the
jar is full...

At what time was the
jar half full?

Exponential ~~F_n~~ F^n



Where does it
hit the
x-axis?

How much
is it
increasing
by.

Exponential Growth

- bacteria in a dish

- \$ \$

- Speed - - wow

- population growth

Asians

Exponential Decay

- radioactivity (half life)

- How an object loses its worth
(depreciation)

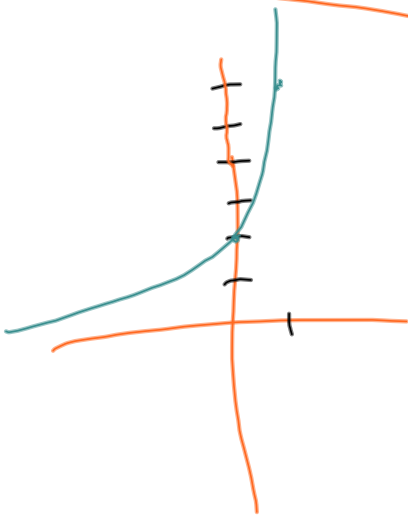
- Acceleration of slowing down

- Finance ...

Americans

$$y = \left(\text{initial value} \right) \left(\text{multiplier} \right)^{\text{duration}}$$

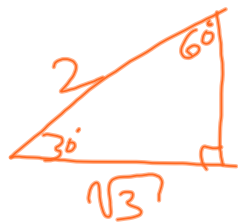
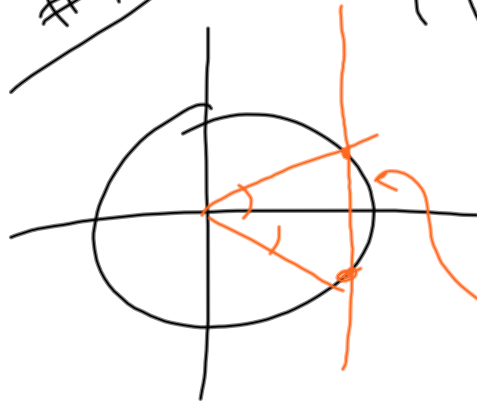
$$(0.01)(2)^{31}$$



$$\underline{y = 2 \cdot 3^x}$$

prac
#10

Find t so $\cos t = \frac{\sqrt{3}}{2}$



$$t = 30^\circ \left(\frac{\pi}{6} \right) + n(360^\circ)$$

$$\text{also } t = -30^\circ \left(-\frac{\pi}{6} \right) + n(360^\circ)$$

(11)

$$[0, 2\pi]$$

$$\sin t = \frac{\sqrt{3}}{2}$$

$$t = 60^\circ \quad \left(\frac{\pi}{3}\right)$$

$$180^\circ - 60^\circ = 120^\circ \quad \left(\frac{2\pi}{3}\right)$$

